Patrick J. Leary
Alvarion, Inc.
5858 Edison Place
Carlsbad, CA 92008

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Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

RE: Response to ET Docket Number 02-135 – Spectrum Policy Taskforce Seeks Public Comment on Issues Related to Commission's Spectrum Policies

Dear Commissioners:

We appreciate the opportunity to present our views with respect to re-thinking of the Commission's spectrum policies. The electromagnetic spectrum is one of the public's greatest assets. But this asset is practically finite and increasingly populated. Alvarion views the Commission's request for public input as a significant step in better protecting this asset. This set of responses relates primarily to unlicensed bands and I have first presented some background to provide perspective regarding Alvarion's position.

Corporate background: Alvarion (the merged companies of BreezeCOM [FCC vendor code 'LKT'] and Floware), a global leader in providing wireless broadband systems specifically built for the application. We develop, produce, and market worldwide, products operating in bands ranging from 2.4GHz to 26GHz, including all prominent bands in between. We are produce and market multiple technologies from FHSS and DSSS spread spectrum systems to OFDM and single carrier products. Recent independent data puts our market share around 50% globally of all deployed systems sub-10GHz. Though the US data is difficult to pin down due to proliferation of aftermarket customized WLAN hardware in use for broadband deployments, our US share is between 20%-30% of deployed subscribers, including WiFi-based networks.

Alvarion has a very strong reputation in the US market for "playing by the rules" with respect to FCC regulations. We have been very earnest in educating the marketplace about the rules and asserting the importance of operators abiding by the regulations. Alvarion is also a major proponent of IEEE standards developments. We were a major contributor to the first 802.11 standard and have been active in every relevant standard development since, including 2 years as co-chair to the Task Group A (802.11a) committee. As well, we are key members of 802.16(a) wireless MAN efforts.

Filer background: On behalf of Alvarion, Inc. I am the market "evangelist" for wireless broadband, specifically wireless broadband using the unlicensed bands. I travel throughout North America speaking to economic development groups, trade association members, press, analysts, etc. about the many and unique advantages of providing broadband to the non-metro ('rural' is too restrictive) market using unlicensed wireless systems. The nature of the unlicensed market has historically been widely misunderstood, even at the press, analyst, and regulatory levels. I am also active in respective industry groups such as the Wireless Communications Association where I serve as an Executive Committee Member of the License Exempt Alliance (LEA).

Recently, I participated in two (2) FCC briefing. The first was in an LEA meeting with Dr. Michael Marcus of the OET wherein we discussed challenges unique to the license exempt community. The second meeting was an independent educational briefing about the unlicensed wireless broadband market with staff of the OPP organized by Dr. Robert Pepper and the wireless ISP (WISP) advocate Marlon Schafer. My role was to issue the market overview, wherein I sought to hone the definition of what is unlicensed wireless broadband and to present data regarding the scale and nature of deployments.

Response:

Our responses most specifically relate to issues respective to delivery of wireless broadband services by various operators to the municipal, commercial, and consumer markets. Such services include, but are not limited to, delivery of IP-based services such as high speed Internet access, VoIP, VPNs, and video using both licensed and unlicensed bands, but this response primarily regards unlicensed bands. The numbers DO NOT correspond to the Commission's list of 28 questions.

1. ***Definitions –*** Before any revision of policy can occur, the Commission needs to assess and properly define terms. A clear case of inadequate definition is the sets of rules governing fixed wireless access (FWA). FWA is too restrictive a term since it is, by definition, limited to 'fixed' applications. This devalues the core advantage of wireless – mobility. All current FWA-specific rules should be accordingly amended to permit at least limited mobility. 'Mobility' in turn is sub-divided into two (2) sets: nomadic and roaming. Bands sub-3GHz can be well suited for at least nomadic use, such as stopped police vehicles needing to access law enforcement databases or needing remote administration of clients (such a virus updating). Public safety benefits from such use are profound. Such applications can exist within a network whose primary subscribers may or may not be fixed. This adds value to the network in both a public sense and in terms of network equity. The Commission should recognize and encourage such applications in all sub-3GHz bands, licensed and unlicensed.

2. ***General policy making -*** Even the most forwarding thinking policies seldom can anticipate the breadth of applications that may be permitted and fostered by the policy. What regulatory body expected Part 15 ISM bands would be utilized in increasing scale to deliver high speed Internet access to many communities? Conservative estimates show that at least 2,500 US communities now have such access. This success is hampered by the prevalence of highly divergent applications using ISM bands. Accordingly, the best policies seek to promote innovations in applications and spectral efficiency. Policy that is restrictive or too application specific create regulatory burden and can stifle investments in both R&D and operator deployments.

3. ***Indoor vs. outdoor delineation and ratio-based rules -*** Spectrum policy should, however, achieve greater specificity in delineating rules relative to indoor use and outdoor of spectrum, especially as it relates to power and spectral efficiency. Indoor, the use tends to be limited to the consumer or commercial resident property owner/lessee. Short of risking health, policy should continue to permit a wide variety of applications and spectral bands. Efficiency and interference are clearly minor concerns to the occupant; they want choices that promote productivity and quality of life.

   Outdoor systems have inherently different burdens that necessitate efficiency and interference mitigation. Power requirement are much higher. However, current power limitations are mostly arbitrary and thus limit innovation. Instead, technical advancement can be promoted if rules are created that encourage radio intelligence and reward efficiency. This can be accomplished with ratio-based rules. For example,

   A. For example, the lowest power networks would be those using omnis. If higher power is required, such should be permitted if sectors are deployed. Further, the amount of power should be in ratio to the 'tightness' of the horizontal beamwidth and relative to the isolation characteristics. The tighter the pattern and better the isolation, the higher the permitted power may be for the link.

   B. In addition, each link, whether point-to-point (PTP) or point-to-multipoint (PMP), would be required to use the minimum power necessary to establish and maintain the link to certain QoS threshold, perhaps "five nines." This will encourage the development of intelligent radios and smart antennas with features such as automatic dynamic adaptive power control.

   C. Also, a minimum benchmark of spectral efficiency should be required for any system deployed outdoor in a cellular architecture.

4. ***Encouraging coordination –*** While we believe that coordination cannot be made mandatory in the unlicensed bands in a behavioral sense, we do believe the Commission can adopt some simple and sensible methods that both encourages coordination, while simultaneously serves to enable accurate data collections and facilitate enforcement of regulatory compliance. The Commission should leverage Internet databases to promote coordination of outdoor unlicensed systems. While deployment of wireless broadband in license-exempt bands would still be unlicensed, each "for profit" operator should be required to register or declare themselves in a federally maintained database that list grid coordinates of all points of presence, type system deployed, and their official contact information. This will enable operators to contact each other in the interest of voluntary coordination. There should be a field in the registration that specifically asks the operator whether the system deployed is FCC-certified respective to whatever set of governing rules exist. Entry into the database would be public record and presented such that consumers could also search for service in their area. The database should be mandatory and a nominal fee (e.g. $100 per annum) should be collected annually. The proceeds will serve to administer the database, fund reasonable enforcement (of compliance), and to encourage operator cooperation and coordination.

5. ***Safety and best practices -*** Of concern to Alvarion is also the safety of those installing systems as well as quality of designs and installation. We know that wide spread violations to OSHA rules and FCC regulations currently occur in the license-exempt market. Such systems a deployed on a variety of structures from towers to buildings. Risks to the public exist do to poor wind loading, mounting, grounding, etc. However, increasing these systems are providing critical services to schools, hospitals, public safety systems (police and fire), businesses and consumers. These systems are becoming, in part, the defacto telcom infrastructure of the next generation in many cases. As such, we are extremely concerned that current policy does not more firmly support the build-out of such infrastructure in the high standards Americans currently enjoy in the wired space. Americans deserve a "first world" infrastructure, not a "third world" build-out. Therefore, we support the addition of some non-technical standards. Possible examples that have some support within the operator community include:

   A. No entity can install a system on a tower or multi-story building unless they hold a specific certification gained through one of any number of OSHA and FCC approved training centers and curriculums. Such a curriculum extends beyond safety to include other elements such as grounding, wind loading, etc. OSHA approves their safety curriculum. The FCC approves the RF-specific curriculum. The certifying center issues those passing the course a special numbered card with photo. Each number identifies the student and the center, and the number is registered in a public FCC database. Re-certification testing is required every x years. Any center found to have issued a fraudulent card gets heavily fined (or indicted) and has their license revoked, as well as all cards issued within the past x months revoked. Revoked cardholders are notified and given a grace period for retesting through another center (without having to take the course). This has the added benefit of forcing the students and cardholders to chose a reputable center.

   B. No wireless point of presence (WIPoP) system may be installed on a tower or building until the design has been certified RF system designer. Such a designer also gets his special certification from any number of future FCC approved training groups. Such a designer gets a stamp (like a notary public) and affixes his/her name and stamp to the design. The tower owner or building owner retains this document on file for all systems deployed. If inspected and not on file, the tower owner is subject to a fine and shutdown. This has the added benefit of encouraging the operators to work with organized, reputable property owners. The designer also gets a fee because he/she is not only providing verification on the soundness of the design, but verifying that the system meets FCC regulations as well, and that is the primary burden that which they are held responsible. This license can be revoked if an OET inspector finds the primary install to be out of FCC compliance. This list of certification holders also goes into a public database.

Both of these rules help to improve safety and further professionalism the market by promoting a 'best practices' set of standards, but they do so in a manner that moves the burden onto the private sector to encourage self-interest based self policing.

6. ***New spectrum –*** Alvarion supports the creation of new spectrum devoted to outdoor deployments of unlicensed wireless broadband systems. We believe the economic importance of broadband, and the glaring broadband inequity issues in many markets, justifies dedicated spectrum. Ideally, such spectrum would provide a range of less than 100MHz but more than 50MHz and would occupy a band at least sub-2GHz. Space sub-2GHz is critical since even the best technologies can not bend the laws of physics such that foliage barriers can be substantially overcome.

   The ratio-based rules, coordination databases, and the safety and best practices policies would apply to this new band. Should such a band with these rules be created, existing rules within other unlicensed spectrum such a UNII would arguably not need to be changed.

Summary

The current set of Commission rules regarding the unlicensed bands has been remarkably successful. The entrepreneurial nature of the unlicensed bands has fostered wireless broadband deployments at a time when license operators are retreating or waiting. This spectrum has enabled operators in growing numbers throughout non-metro America to seize control of their own communities' destiny. Today, in growing numbers, small local telcos, public and EMC utilities, rural cellular companies, cable companies, police departments, and even cities themselves are taking advantage of the opportunity unlicensed provides.

These new systems are delivering everything from high speed Internet, mobile network access, virtual private networks, and increasingly voice traffic via VoIP and emerging video. And they are be delivered in some of the most ignored markets. In fact, in many regions, broadband equity is now being achieved and it is happening *without* federal government subsidy.

But this growth within the current set of policy has also been problematic. In fact, it can be argued that the rules have been, thus far, too successful such that valuable spectrum is needlessly crowded with inefficient and over powered systems. Conversely, certain arbitrary power limits within the existing rules is making that success difficult to duplicate in some ultra rural markets. Alvarion believes that sensible and simple steps like those outlined herein can solve most problems within the unlicensed bands.

We look forward to assisting the Commission in any reasonable manner necessary to help create a system that protects and encourages the best use of this critical asset.

Sincerely,

Patrick J. Leary
Chief Evangelist
Alvarion, Inc.
Office (352) 592-5409
Cell (770) 331-5849
E-mail: patrick.leary@alvarion.com